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Conference Abstract

Linking Agrobiodiversity Data through Metadata Standards

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Abstract

Agrobiodiversity, or biodiversity for food and agriculture, plays a major role in the sustainability of food production. As stated by FAO 2019, agrobiodiversity can provide food production systems and society with a variety of services as ecosystem services, crops resilience to threats, sustainable intensification, livelihoods, food security and nutrition. The official definition of the concept has been given by CBD 2000 as "a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agroecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes". Thus, agrobiodiversity is primarily based on species and their function in agroecosystems.

Many projects for sharing agrobiodiversity data in a structured way have emerged over the years. One realizes in looking at the Bioversity International (2018) crop descriptors list that the earliest groups of descriptors for crops and some associated data emerged back in the 1970s. In the same list, there are four multi-crop descriptors and derived standards, which are broad standards for crop-related data, namely:

- Core descriptors for *in situ* conservation of crop wild relatives v.1 (Thormann et al. 2013);
- FAO/Bioversity multi-crop passport descriptors V.2.1 (Alercia et al. 2015);

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- Descriptors for farmers' knowledge of plants (Aknazarov et al. 2009);
- Descriptors for Genetic Marker Technologies (Vicente et al. 2004).

These standards share some core elements in common, as taxon, location, a period of collecting, and were intended to be used in the context of data on the occurrence of species in nature.

Darwin Core, a TDWG standard commonly used for sharing data of taxon occurrence in nature (Wieczorek et al. 2012), is a globally used metadata standard, representing "a large majority of the 1.4 billion of species occurrence records shared by the Global Biodiversity Information Facility (GBIF), published by more than 1561 organizations in 59 countries in January 2020" (Body et al. 2020). Darwin Core is a standardized language that applies unique Internationalized Resource Identifiers (IRIs) to each element assigned as a metadata element, plus a label and a definition. It improves the interoperability between databases in the context of the Semantic Web (Duerst and Suignard 2005).

We believe it is possible to use Darwin Core to represent agrobiodiversity data if a metadata extension is developed to enroll the agrobiodiversity concepts missing in Darwin Core. Thus, a research project held at the University of São Paulo in partnership with Brazilian Agricultural Research Corporation started to map concepts and descriptors from the literature for agrobiodiversity data representation. This project is the sequence of the research initiated by Soares et al. 2019. The crop descriptors published by Bioversity International (2018) may be integrated into the metadata extension, but also other standards like Global Genome Biodiversity Network (GGBN) Data Standard v1 (Droege et al. 2016) and the Darwin Core germplasm extension (DwC-germplasm). At the moment, we are designing a mind map to organize the agrobiodiversity concepts. We expect the metadata extension will be useful for the scientific community to share agrobiodiversity data as linked data, applying Resource Description Framework (RDF) as a resource relationship model, for example.

Keywords

agricultural biodiversity, Darwin Core, biodiversity of food and agriculture, metadata modeling

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